Buy U. S. War Savings Bonds and Stamps

GEOGRAPHIC SCHOOL BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated as a non-commercial institution for the increase of geographic knowledge and its popular diffusion. General Headquarters, Washington, D. C.)

NOTICE

If you receive a Renewal Blank with this issue, your subscription has expired. No further Bulletins or reminders can be sent to you until your renewal is received. Since war restrictions on paper will curtail the supply of back issues, you are urged to renew immediately in order not to miss any issues which you may be unable to replace.

October 2, 1944. Vol. XXIII. No. 1.

1. Germany's Rhineland of Prime Military Value
2. Where Are the Yanks? 13. Normandy, France
3. Palau a Steppingstone to the Philippines
4. Wood Extends Its War Service at Home and Overseas
5. Geo-Graphic Brevities: Walkie-Talkie—World Map

Willard Price

BEFORE "COTTON" GROWS ON TREES IN PALAU, THE BARK HAS A BITE

Americans who have recently landed in the Jap-held Pacific islets of the Palau group may be accustomed to shinnying up all kinds of trees at home, but they will be cautious about climbing Palau's kapok trees for a reason which this smiling Palauan points out. When the tree is young, the bark is studded with fanglike spines. After its bright flowers bloom, it bears a crop of pods in which the seeds are pillowed on downy fibers known to commerce as silk-cotton or kapok, used for life preservers as well as pillows and upholstery. Before the war the United States was importing yearly some $1,500,000 worth, at about $200 a ton, chiefly from the Netherlands Indies. "Cotton" growing on trees is but one of many oddities the Americans will see when their fighting is finished in Palau. (Bulletin No. 3).

GEOGRAPHIC SCHOOL BULLETIN

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic School Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Originally entered as second-class matter January 27, 1922; re-entered as of April 27, 1943, Post Office, Washington, D. C., under Act of March 3, 1879. Copyright, 1944, by National Geographic Society, Washington, D. C. International copyright secured. All rights reserved. Quedan reservados todos los derechos.

Germany's Rhineland of Prime Military Value

AMERICAN forces pushing into western Germany are following the footsteps of an earlier generation of U. S. fighting men. This was the path of the American Army of Occupation which slogged through wintry Germany as far as the Rhine in 1918, in accordance with the terms of the Armistice.

The post-Armistice advance toward the Rhine began on November 17, 1918, when four Allied armies moved in to occupy the Rhineland—the Americans with headquarters at Koblenz, the French at Mainz, the British at Cologne (Köln), and the Belgians at Aachen. Many a doughboy can recall the streets of Koblenz and the towers of Ehrenbreitstein (illustration, next page). Within six months most of the 200,000 Americans had been withdrawn and sent home. A detachment of about 6,800 men, however, remained in the Rhineland until the American flag was lowered in 1923 and their sector turned over to the French.

Rhineland and Ruhr Industries Among Most Heavily Bombed

The strip of western Germany bordering the Rhine on both sides—then as now the region of foremost military importance—slices off the major portion of the entire nation's heavy industry, nearly half of the larger cities, the busiest transportation route, and a large share of the places associated with the German people's pre-Nazi culture.

Along the Rhine itself, or on rivers or railroads feeding into the Rhine basin, stand a third of Germany's cities of more than 200,000 and nearly half of the cities of more than 100,000. Cologne, Düsseldorf, Duisburg, and Mannheim on the Rhine have more than a quarter-million people each. In the Rhineland's industrial annex, the Ruhr—normally Germany's most thickly peopled region—stand Essen, Bochum, Wuppertal, Dortmund, and Gelsenkirchen, of comparable size.

Because of the industrial and transportation importance of the Rhineland, the first Allied air raid on Germany was aimed at this district. The air war on the Nazis began with the bombing, on May 11, 1940, of the railways at München-Gladbach, a junction city halfway between Düsseldorf and the Netherlands.

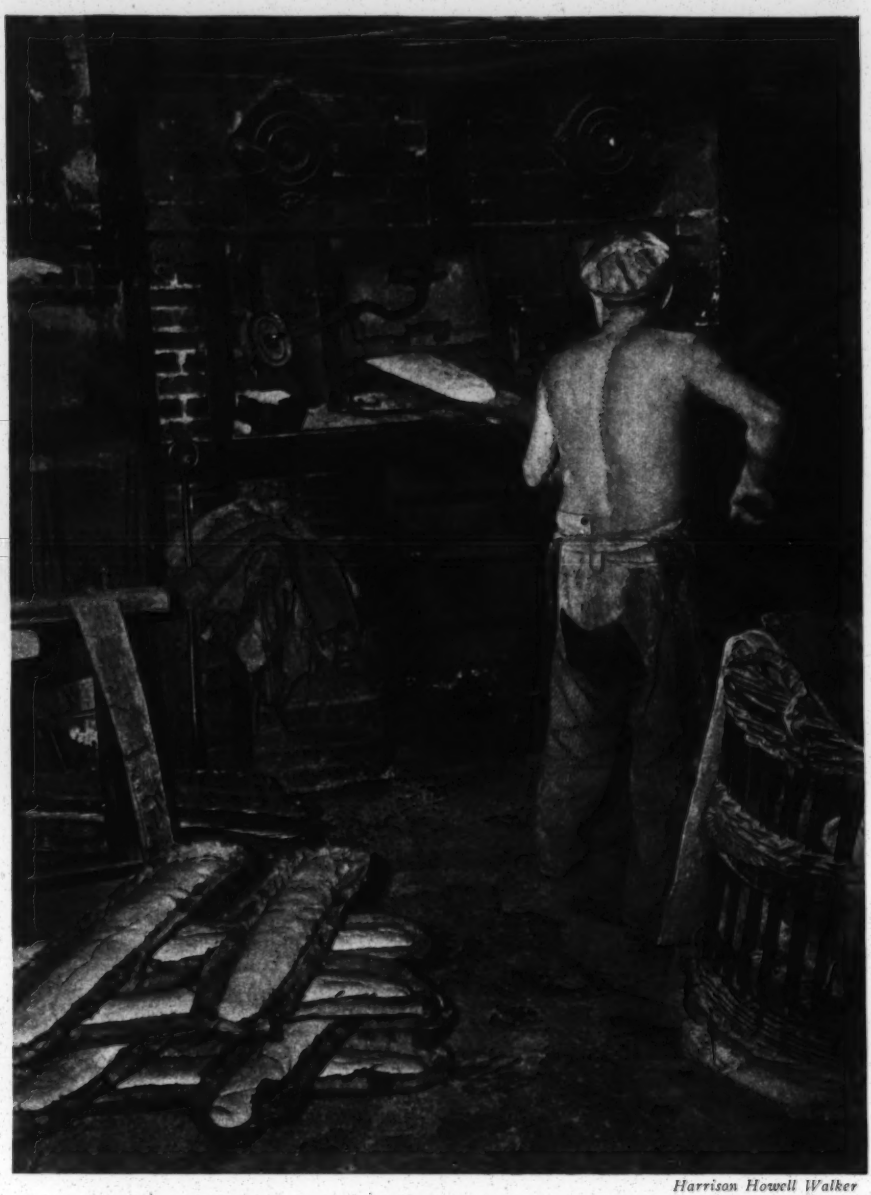
Among the most heavily bombed targets in Germany have been the industries of Cologne—aluminum, explosives, chemicals, oil, and steel; the railways and wharves of Duisburg, Europe's largest inland river port (above tidewater); the airplane and explosives factories of Frankfurt, up the Main valley from the Rhine; the munitions plants and steel mills at Düsseldorf; and the bridge-linked cities of Mannheim and Ludwigshafen at the head of Rhine navigation, where Allied bombers have attacked the docks, railroad yards, nitrogen plant, oil refinery, munitions factory, and submarine engine plant.

Historically a Buffer District

Smaller towns also share in the Rhineland's war industries. The synthetic oil plants of Homburg and Wesselring, the plane factory of Speyer, the oil refinery of Wesel, the chemical and explosives works at Leverkusen, the factories of Kochem, and the blast furnaces of Siegburg, Bonn, Merzig, and Mutterstadt are among those whose output has drawn attacks from Allied bombers. Bad Rheinfelden, Grevenbroich, and Ludwigshafen contribute to the aluminum output.

The Rhineland's industries are fed from the adjacent Ruhr, Germany's richest source of coal, iron and steel, and from the Saar to the southwest.

UMI



Harrison Howell Walker

THESE SUPER LOAVES MAKE NORMANS GO FOR BREAD IN A BIG WAY

On the same large scale as France's prewar wheat fields, which covered a tenth of the country, Normandy's loaves of bread are long, wide, and handsome. Comfortably costumed for his warm trade, this baker of Alençon in central Normandy shoves loaves as long as his arm into the round-eyed brick oven with a long wooden paddle. On basket-trays, stacked crisscross on the floor, other loaves await their turn to bake. When the baker scoops them out they will have grown to yard-long super loaves whose size is in keeping with their importance on the Norman's menu. These giant loaves appear at every meal, along with cider, in the farming districts of Normandy where the Allies made their triumphant entry into continental Europe (Bulletin No. 2).

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Where Are the Yanks? 13. Normandy, France

(This is a supplement to Vol. XXII's series of twelve articles called "Where Are the Yanks?", about regions where American service men and women are stationed.)

YANKS who swarmed over Normandy with Allied liberation forces trod paths of conquest that were centuries old when America was discovered.

Romans, Franks, and Saxons had their day. About 820 A.D. Scandinavian seafarers swooped down on the coast in their dragon-prowed galleys. It took them a century to make good their beachheads. They settled along the lower reaches of the Seine and made Rouen their capital. These Norsemen were ancestors of the Normans who gave their name to the region, conquered England in 1066, and set a Norman duke on the English throne.

The western portion of Normandy projects north into the English Channel, as the Cotentin Peninsula. The north coast line curves inward with the Bay of the Seine and bulges outward again to the east beyond Le Havre. The old provinces of Picardy and Ile de France form its eastern border, with Maine (now the departments of Sarthe and Mayenne) to the south, and Brittany at the southwest corner (map, next page).

Nature Is Moderate in Normandy

Normandy comprises about one-twentieth of the area of France and has about one-twentieth of its people (2,332,000 before the war). Its 11,800-square-mile area about equals that of the States of Delaware and Maryland combined.

Nature avoids extremes in Normandy. Hills are low, rivers are short, temperatures are moderate. Southward from the chalk cliffs and sandy beaches of the coast the country unrolls like a rumpled green rug figured with orchards and meadows. This pleasant pattern is criss-crossed by rivers, railways, and roads, and dotted with villages and towns. Normandy's own peculiar hedgerows are ridges, thick with trees and bushes, which rise 3 to 5 feet above the fields and roads they border, and are usually paralleled by deep ditches.

Generations of thrifty farmers have made Normandy comfortable and self-sustaining. Normally Yanks would have seen well-kept farmhouses and barns, acres of wheat, rye, oats, flax, and sugar beets. For Normandy was literally a garden spot. Apple blossoms added pink patches to the spring landscape; fields were white with buckwheat. Poplars bordered the roads for miles. There were large stands of timber such as the Forests of Breteuil and Evreux.

Old Customs and Old Costumes Still Survive

Most Normans keep close to the soil, farming and dairying. The Channel port of Le Havre, with a prewar population of 164,000, was their biggest city. Rouen, the old capital, ranked next with 122,000. Caen, home of William the Conqueror, had 61,000; Cherbourg, 39,000; Dieppe, early Commando objective, 25,000. All other towns had fewer than 20,000.

Old customs still persist in rural Normandy. Farmers wear wooden shoes, cotton caps, and smocks like their fathers; some older women favor the snowy headdresses and the shawls their mothers preferred. Laundry is still done along streams and canals, and around village wells. Water wheels still turn the stones of ancient mills. Farm life is keyed to the pace of the horse. Ponderous percherons—first bred in the Perche district of southern Normandy—do the heavy work. Lighter horses pull high-wheeled carts to market, sometimes hitched tandem to make a "train." Many French cavalry horses came from Normandy.

Almost every village has its dairy. No lush meadow is complete without its herd of cows. The Cotentin breed is famous for milk production. Parisians drank much of Normandy's milk and cream; Londoners ate its butter. Its cheeses, such as Camembert and Neufchâtel, were famous around the world.

Restoration rather than modernization has been the Norman way—constructing buildings of 13th-century design by 20th-century methods. Only in sizable towns do hotels provide electricity and running water.

Yanks at their tongues' ends to talk with the natives have turned to schoolbook French in vain. Normans use 5,000 words foreign to orthodox French. The old Norse language survives in some place names—Dieppe was once "deep"; the "fleur" of Harfleur and Honfleur was "fliot," meaning small river or channel; Fécamp was "fiskr" or fishery; Yvetot was Ivo's "toft" or enclosure.

Normans celebrate birth, marriage, and death, and simple meals with cider, great quantities of which are produced from Normandy's apples. Norman cooks are expert at omelets and

UMI

These industrial centers are conveniently linked by transportation along the Rhine itself—especially important in shipping coal—as well as along the canals and railroads which parallel the river and radiate from it on both sides.

The lower slopes of the Rhineland's rounded hills are terraced with vineyards in the river valleys. Above, stretch wheat fields and pine forests.

Since the era of Caesar's Gallic wars the Rhineland has been a buffer region. Charlemagne found it a convenient site for his capital, at Aachen (Aix-la-Chapelle). Napoleon seized it. The Versailles Treaty provided for occupation of the district by the Allies for as long as 15 years. The armies of occupation, however, were all withdrawn by 1930.

The first military step toward war taken by the Nazi regime was the remilitarization of the Rhineland, when German troops were sent into the region in 1936, in defiance of the Versailles Treaty.

Note: A new map, Germany and Its Approaches, appeared as a supplement to the *National Geographic Magazine* for July, 1944. A price list of maps may be obtained from the headquarters of the National Geographic Society in Washington, D. C.

See also, "Cologne, Key City of the Rhineland," in the *National Geographic Magazine* for June, 1936*; and "What Is the Saar?", February, 1935*; and these GEOGRAPHIC SCHOOL BULLETINS: "Nazi Aircraft Centers Bombed," March 27, 1944; "Blasts of British Bombs Blend with Mighty Roar of the Ruhr," February 1, 1943; and "'Father Rhine,' Bomber's Guide to Germany's War Industries," October 12, 1942. *(Issues marked with an asterisk are included in a special list of magazines available to teachers at 10¢ each in groups of ten.)*

Bulletin No. 1, October 2, 1944

Donald McLeish

THE STARS AND STRIPES FLEW ABOVE THIS GERMAN FORTRESS 25 YEARS AGO

A peaceable invasion, in accordance with the terms of the Armistice, brought the U. S. Third Army in December, 1918, to occupy the Fortress of Ehrenbreitstein on the east bank of the Rhine, just across the river from Koblenz, the headquarters of the American forces in Germany for the next three years. The fortress is about 125 years old; it replaced fortifications blown up by Napoleon's army. The site, at the confluence of the Mosel (Moselle) and Rhine rivers, has been of military importance since the days of the Caesars. Below the fortress stands the town of Ehrenbreitstein, linked with Koblenz by bridges.

Seine was a dumb-waiter by which much of the food was conveyed to Parisian tables.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)
General Headquarters, Washington, D. C.

Palau a Steppingstone to the Philippines

THE Palau Islands, where United States Marines have seized positions from the Japs, lie 560 miles east of the Philippines and about the same distance north of the western tip of New Guinea. They appear on Pacific maps as a tiny cluster of pinpoints at the western end of the Caroline group. Tiny as they are, their principal island, Babelthuap (known also as Palau), is the second largest of the 1,400 volcanic and coral-built islands of Micronesia mandated to Japan by the League of Nations after World War I.

Babelthuap, 27 miles long north to south and about eight miles in greatest width, is only ten square miles smaller than Ponape, 1,600 miles east in the Carolines, the largest mandated island. Covering about 120 square miles, it is slightly more than half the size of Uncle Sam's recaptured Guam, 800 miles northeast, which, though within the mandate area, was specifically excepted from the Mandate. Largely wooded, Babelthuap has hills reaching up to 600 feet.

Jap Bases on Arakabesan and Koror

Some 25 other islands extending in a 40-mile chain south from Babelthuap total about 50 additional square miles of land. Chief among them are Koror, Urukthapel, Peleliu, and Angaur.

Southernmost of these is Angaur, whose town happens to be called Saipan, thus adding confusion for news readers newly familiar with the Yank base on the Marianas island of that name, 900 miles northeast.

Added to these 26 land spots of the Palau group are coral islets and reefs in profusion, the reefs extending for many miles west and north of the land.

On tiny Arakabesan and Koror, islands just south of Babelthuap, the Japs are known to have had their main naval and aeronautic bases in the group.

Koror, Morotai (newly occupied island north of Halmahera of the Moluccas), and Davao, chief port of Mindanao, form a near-equilateral triangle, 500 to 600 miles on each side. Davao is due west of Koror, Morotai is southwest.

"Order of the Bone" Is Exclusive

The Palau islanders are physically more like their neighbors in the East Indies than are natives of the eastern Carolines. The belief is that Indonesian peoples were dispersed in prehistoric times, fanning out over the whole Micronesian and Polynesian areas.

The native population in the Palau Islands has been declining. Estimates put the total for the Palaus 150 years ago at 40,000. By 1875 the figure had shrunk to 10,000. In 1916 the number had dwindled to less than 5,000. Before war came to the Pacific many of the smaller islands were uninhabited.

Islanders have great respect for "the Order of the Bone." Chiefs and other influential men craving distinction wear armlets shaped from the atlas bone of the manatee or sea cow. The bone is prized as a badge of importance because it is regarded as something hard to get.

The islanders make utensils of earthenware, an accomplishment rare in other islands to the east.

Palau food consists of fish, taro, papaya, breadfruit, mango, and the orange. Copra, pearl, and turtle shell have been the islanders' stock in trade.

The discovery of the Palaus is recorded with variations. Villalobos is credited

UMI

many special dishes with local names. Norman bread is literally a staff of life—a yard long and a foot wide (illustration, inside cover).

Explorers, Saints, and Martyrs Brought Fame to Normandy

Norman products range from Caen stone to the delicate handmade lace of Alençon. Norman pottery had a wide market.

Normandy has magnificent churches and massive towered castles. Martyrdom and saint-hood are familiar stories, and generations of tourists have tramped over ground hallowed by Joan of Arc, the Maid of Orléans, and St. Teresa of Lisieux, the Little Flower.

Norman explorers, LaSalle of Rouen, Ribault of Dieppe, and Denys of Honfleur, made North America so well known to their countrymen that they came to regard it as Trans-atlantic Normandy.

Note: Normandy is shown on the National Geographic Society's Map of Central Europe and the Mediterranean.

See also "The Coasts of Normandy and Brittany" in the *National Geographic Magazine* for August, 1943; "Rehearsal at Dieppe," October, 1942*; "France Farms as War Wages," February, 1940*.

See in the GEOGRAPHIC SCHOOL BULLETINS for May 15, 1944, "Europe's Invasion Coast Is Most-Studied Geography."

Bulletin No. 2, October 2, 1944

NORMANDY, PANTRY FOR PARIS, WAS PATHWAY FOR ALLIED FORCES

Dotting sandy beaches of the English Channel, lying in curves of rolling green uplands, the towns and cities of France's northern farming region had familiar associations for Yanks who fought and marched through them. Alençon meant lace; Bayeux, tapestry; Caen, building stone—and so on down the alphabet. At the western gateway to the French capital, Normandy with its orchards and dairies and cheese factories might be called the pantry of Paris. The Seine was a dumb-waiter by which much of the food was conveyed to Parisian tables.

platform of stone, is ordinarily tabu to sightseers, especially the local women; only elder tribesmen may enter.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Wood Extends Its War Service at Home and Overseas

"WOODMAN, spare that tree" can now be paraphrased to "Civilian, save that lumber!" A recent War Production Board order, made necessary largely by the U. S. Army Engineers' needs, forecasts a cut of as much as 50 per cent in civilian use of lumber. Whether you are a householder dreaming of a new porch floor or an industrialist planning to expand the plant, you will be affected by this curtailment of lumber supplies.

Just how much wood pulp is annually crammed down the maw of the war-geared United States? Production of pulp in 1943 was 9,050,000 tons—an 11.5 per cent decrease from that of 1942. Pulp mills all over the country are affected by such factors as a labor shortage; loss of imports from Sweden, Finland, and Norway; and curtailment of Canada's shipments, the greater portion of which are tagged for British markets.

Age of Wood Returns

Wood is one of the most important raw materials in the world. As a substitute for steel (1,000 feet of lumber save one ton of steel), military engineers are using vast quantities of wood. It goes into trusses; into plywood planes, which are lighter and more easily repaired than all-metal ones; and into hangars, bridges, and trestles. Featherweight balsa wood, imported from Costa Rica, Colombia, Nicaragua, Guatemala, and Ecuador, is used for life rafts, mine floats, and life preservers. The Navy's PT boats, formerly made of metal, have been lightened 33⅓ per cent and strengthened as well through the use of wood.

Although it seemed at first improbable that an Age of Wood would reappear to compete with an Age of Metals, necessity and human ingenuity have brought this about. In 1943 an estimated 5,000,000 tons of metal were released for war service through the use of wood for manufactured products. From the construction of giant hangars to the making of vanillin out of waste chips, the saga of wood is lengthening.

In the manufacture of explosives, rayon, surgical dressings, molasses, shoes, glycerine, blanket substitutes, acetate table mats, and other articles too numerous to mention, wood pulp not only proves itself a ready and willing servant, but forecasts its myriad uses in the postwar world.

Redwood Bark Helps Make a Suit

The public can easily visualize the familiar uses of wood for paper, furniture, and lumber, but it still receives with some skepticism the novel utilization of former waste products. As late as 1930, fully 60 per cent of every tree cut in the United States was wasted. Now what is the picture? Take just one of the by-products—sawdust. It is processed into a material which is virtually hard as nails, for it is difficult to drive a nail through its surface. It makes sawdust plaster to replace gypsum. It is compounded into staple war-needed acids such as oxalic, one use of which is in laundries for acid rinses.

Redwood bark, formerly of little value because of high water content, has recently joined the war salvage program. Its pulp is glamorized into rayon and, combined with wool, makes cloth for milady's suit, or material for the mattress on which she sleeps.

Old pine stumps are made to yield naval stores—the old term for rosin and

UMI

by Spaniards with sighting the islands in 1543. The English make a case for Sir Francis Drake in 1579. One explanation of the islands' name is that Palau is not a Micronesian word, but comes from the Spanish as a corruption of *palos*, meaning "masts," which coconut trees, seen from the sea, presumably resembled.

Note: The Palau Islands may be found in a large-scale inset on the Map of Southeast Asia and Pacific Islands from the Indies and the Philippines to the Solomons, which is the supplement to the October, 1944, *National Geographic Magazine*.

For additional information, see "Springboards to Tokyo," and the series of full-color reproductions of paintings by Lt. William F. Draper, USNR, "Painting History in the Pacific," in the *National Geographic Magazine* for October, 1944; "Hidden Key to the Pacific," June, 1942*; and "Mysterious Micronesia," April, 1936*; and these GEOGRAPHIC SCHOOL BULLETINS: "Bombed Caroline Islands Hold Strong Jap Bases," February 14, 1944; and "New Guinea to Tokyo: Pacific Path of Island Steppingstones," April 5, 1943.

Bulletin No. 3, October 2, 1944

Junius B. Wood

YANKS MAY APPEAR IN PALAU'S NEW NEWSREEL MURALS

Palau builders leave generous wall spaces beneath the overhanging eaves of the thatched roof on public structures such as this council house on Koror. Then local artists carve and color the wood to make murals that chronicle tribal history, full of incidents involving fish, birds, canoes, and palm trees. Many murals already include the coming of Spanish, German, then Japanese overlords to the islands; and no doubt some future installments will depict the arrival of American forces. This council house, raised above the ground on a four-foot platform of stone, is ordinarily tabu to sightseers, especially the local women; only elder tribesmen may enter.

Army too, by contributing to the varnish that covers planes and tanks. Rosin coats grenades and wires in airplane instruments.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Geo-Graphic Brevities

WALKIE-TALKIE CLIMAXES CENTURIES OF WAR NEWS FLASHES

IT MAY be a far cry from smoke signals and beating tom-toms to the walkie-talkie, but this one-man military radio station is their youngest cousin. Wars down through the ages have promoted rapid communication, spurred by the life-and-death need to speed a warning or call for help. The walkie-talkie is the present war's contribution, a compact and complex radio sending and receiving set which can be carried in a knapsack on a man's back. This portable radio telephone is in the van of invasions, carried by paratroopers and Signal Corps soldiers.

Before the Age of Electronics, a news flash from the battlefront was likely to be actually a flash. The ancient Greeks had signal systems for sending messages, spelled out in lights. Signal fires flashed to the Athenians the news of the fall of Troy, and more than 2,000 years later hilltop fires glowing across Kent reported to London the arrival of the Spanish Armada.

Among man's earliest methods of signaling were wigwagging and heliographing. The latter system makes use of reflected flashes of sunlight. The U. S. Army Signal Corps has made great improvements in this ancient device.

Smoke signals were used by Europeans centuries before the American Indians were found sending such messages. African natives beat out signals on drums and hollow logs. The ancient courier system—dispatching messages by runners and horsemen—now also employs motorcycles, scout cars, jeeps, dogs, and pigeons.

France developed the mechanical semaphore in Napoleon's time. The semaphore arms were mounted on belfries, tall buildings, and other elevations in sight of each other. Paris was connected with Lille by an experimental line which proved its value with reports of battle. In two years the system covered France. When Napoleon invaded Russia, 1,200 stations kept him in touch with Paris. Block signal systems on railways derive from the early semaphore.

The telegraph's value for military purposes became apparent during the Civil War. The Signal Corps built an extensive army network linking frontier posts and settlements. By 1880 the Corps was operating 5,000 miles of telegraph lines.

Note: See also "Winged Words—New Weapon of War" (Radio), in the *National Geographic Magazine* for November, 1942*; and "Radar Just One Offspring of Up-and-Coming Electronics Family," in the GEOGRAPHIC SCHOOL BULLETINS, April 3, 1944.

* * * * *

GEOGRAPHIC MAP MADE LARGER FOR WORLD THAT WAR MAKES SMALLER

A GIANT ten-color map of the world, roughly 5 feet 7 inches by 3 feet 7 inches, has just been published by the National Geographic Society. This size is especially adapted for use in classrooms, libraries, and auditoriums.

This new map is a larger edition—three times the original area—of the World Map which the Society issued as a supplement to the *National Geographic Magazine* for December, 1943. Drawn to the modern Van der Grinten projection, the map is an improvement over those drawn to the old 16th-century Mercator projection because it has more accurate outlines in the polar regions.

Boundaries are shown as of September 1, 1939. The governments of Pacific islands are indicated as they were before the attack on Pearl Harbor. Arrows

UMI

turpentine—through a distillation process (illustration, below).

Experiments with wood by-products as food have been carried out extensively in recent years. Sugar made from wood through hydrolysis can be processed into industrial alcohol, protein yeast, and other derivatives. By using the waste liquor from pulp mills employing the sulphite process, a high-test alcohol can be manufactured for about 20¢ a gallon.

Concentrated proteins from wood by-products can enrich food for human beings and for cattle. Food shipments to the civilians of liberated countries in Europe include these first aids in the fight against tuberculosis. As much as 55 per cent protein value can be added to dried eggs by the admixture of wood-derived yeast.

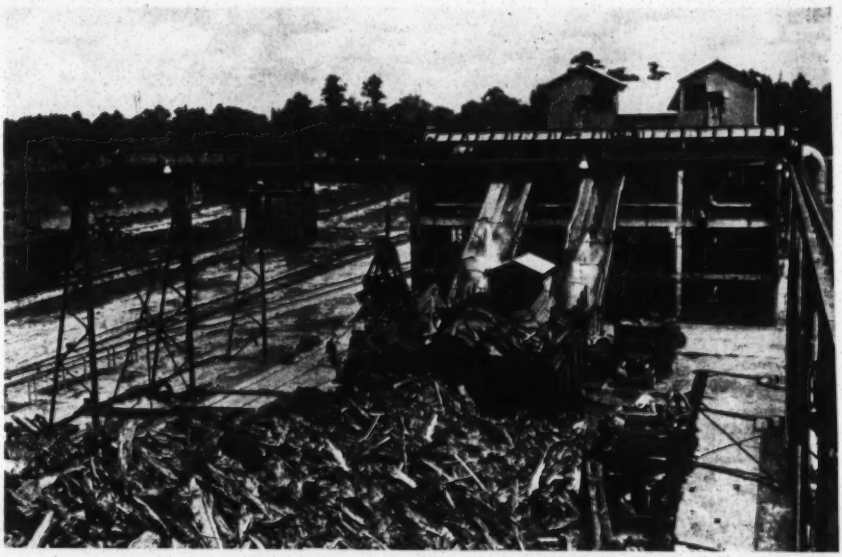
One result of the vast experimentation with wood chemistry is that you can no longer tell a tree by the coat it wears. Like some film star wishing to change the color of her hair, wood can—with the assistance of man—also change its color. A recently announced chemical can turn blondish pine to the flaming red of cherry or the rich red-brown of mahogany. Another chemical "shot in the arm" can greatly accelerate the growth of a tree.

"Make way for wood!" might well be the battle cry of the nation's mighty forest empire. In response, Uncle Sam's army of chemists is continually devising new products to supplement the 15,000 or more now made from lumber and its by-products.

Note: See also, in the *National Geographic Magazine* for February, 1939*, "California's Coastal Redwood Realm,"; "Chemists Make a New World," November, 1939*; and "Washington, the Evergreen State," February, 1933.

And "New Uses for 'Naval Stores': Rosin and Turpentine Go to War," in the GEOGRAPHIC SCHOOL BULLETINS, November 1, 1943.

Bulletin No. 4, October 2, 1944



J. Baylor Roberts

PINE "SCRAP" GOES TO MARKET AND COMES OUT NAVAL STORES

By trucking loads of old pine stumps to a naval stores plant, farmers near Hattiesburg, Mississippi, both clear up their fields and clean up some extra cash. If left in the fields, the stumps would impede plowing. Dynamited out and trucked to the plant, like farm produce to market, the jagged chunks of yellow pine "scrap" join the war salvage program. A crane (center) drops stumps on conveyor belts which carry them up to the extractor house. There rosin and turpentine are recovered by distillation. Though called naval stores, they help the Army too, by contributing to the varnish that covers planes and tanks. Rosin coats grenades and wires in airplane instruments.

point direction of ocean currents. Important ocean "deeps" are shown. A series of clock faces gives the time at various meridians of latitude when it is midnight at Greenwich, England.

In the lower corners of the map, insets show which side the nations fought on in both World Wars. In the upper corners appear hemisphere maps showing areas surrounding the North and South Poles. A table at the bottom of the map gives English translations for various foreign language geographic terms.

Following the war back and forth across the world—from the Bonins to Belgium, from the Baltic to the Sulu Sea—makes the globe seem small. Air transport has cut distances to an incredible extent. From India wounded Yanks have been flown to Miami in 30 hours.

To trace the course of the war of movement around a smaller world, a larger map is a help in locating the names of new battlefields in Europe; and in the Pacific, strange towns, rivers, and islands once known to few except explorers. The search for such elusive spots as Morotai, Saipan, and Tinian becomes less tedious with the new large map, which has a scale of only 395 miles to the inch.

Note: Copies of the enlarged Map of the World may be obtained at $2.00 each, prepaid, from the National Geographic Society, Washington 6, D. C.

An Index to the 4,874 place names on the Map of the World is also available from the Society's Washington headquarters, at a cost of 25¢ a copy.

Bulletin No. 5, October 2, 1944

Willard R. Culver

GEOGRAPHIC WORLD MAPS TELL THE MEN WHO TELL THE WORLD

Cecil Brown, who has seen most of the world in his travels as news correspondent, looks over a National Geographic Society Map of the World while checking his script before going on the air with his regular broadcast for Mutual stations. Miller McClintock (left), president of the Mutual Broadcasting System, and John Whitmore (center), chief of Mutual's busy News Department, watch the commentator's last-minute preparations. Other Geographic maps on wall and desk are kept ready for easy reference. The Map of the World has now been published in a special enlarged edition, more than 20 square feet, designed especially for wall use in offices, schools, libraries, and other spots where quick legibility is important.

UMI